

Appl. No. 10/729,230
Reply to Office Action of August 23, 2005

REMARKS/ARGUMENTS

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katoh et al. (US 2002/0130943).

Claims 1-7 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Ashida et al. (US 6,773,771).

Claim 1 is amended to include the relationship $150 < y + 17 \cdot \ln(x) < 500$ to define the pulverized silicon particles. Support for this is in the specification at page 12, lines 5-17. This requirement is also present in claim 7 (now-canceled). The newly added requirement of a cationic compound is from original claim 4, now combined into claim 1.

Neither Katoh nor Ashida show or suggest to use silica particles pulverized to satisfy the relationship of:

$150 < y + 17 \cdot \ln(x) < 500$,
required in claim 1 (or former claim 7).

Furthermore, neither Katoh nor Ashida suggest that using silica particles as required, would provide any special effect. However, the inventive effects resulting from the above-described silica particles are described in page 12, line 18 to page 13, line 2:

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"When the value of ' $y + 17 \cdot \ln(x)$ ' satisfy Formula (I), high glossiness, high transparency and high ink absorbing property can be achieved. When the value is less than 150, the recording sheet has only low ink absorbing property even if it achieves high glossiness and high transparency. When the value is more than 500, it is hard to achieve high glossiness and high transparency of the recording sheet."

The Examiner requests more detailed description for the experimental results previously submitted in the Declaration.

The declarant has provided further information requested by the Examiner in the enclosed DECLARATION.

(1) Property of Support

As described in the DECLARATION, Example 1 was followed except as described at paragraph [0219] for sheets 21-39. In fact, all of the Recording sheets Nos. 25, 28, 35, 52 and 54 use a polyethylene coated support as is described in Example 1 (paragraph [0155]) of Katoh.

The Recording sheets described in the present specification were prepared using a polyethylene coated support.

Both Katoh and the present specification use a resin coated support. Therefore, the two are directly comparable.

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(2) Ink

Concerning the ink used for the Experiment, the DECLARATION explains as follows.

The images were formed with an ink-jet printer PM-800 manufactured by Epson Corp. A set of ink-jet inks provided for PM-800 by Epson Corp. was employed in the experiments (cf present specification end of page 37 to top of page 38).

Concerning the silica used, the Examiner takes the position that Ashida discloses both fumed silica and silica prepared by wet processes. Wet silica is not excluded from the disclosure of Ashida.

However, one of the specific feature of the present claim is that the silica particles are prepared by a precipitation method or a gelling method.

Even if Ashida suggests to use fumed silica and wet silica, Ashida does not select wet silica. On the contrary, Ashida selects fumed silica which is not appropriate in the presently claimed invention.

The objects of the present invention are described in page 5, lines 9-14:

"A first objective is to provide an
ink-jet recording sheet which exhibits high

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ink absorbability, high glossiness, high print density, and excellent crack resistance due to formation of a flexible ink absorptive layer. A second objective is to provide a high quality ink-jet recording sheet which also exhibits bleeding resistance."

When employing "fumed silica", the effects of both high ink absorbability and bleeding resistance cannot be achieved at the same time in the presence of a cationic compound.

The reason of the unexpected superior effects by wet silica in the presence of a cationic compound is explained in page 7, line 19 to page 8, line 8 as:

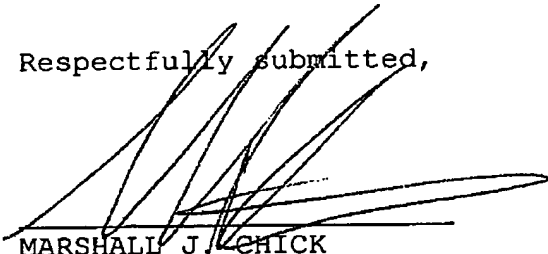
"Further, when cation fixing agents are incorporated into the ink absorptive layer constituted as above, the fixing efficiency of coloring agents is enhanced, whereby it is possible to result in bleeding resistance in an amount of the aforesaid cation fixing agents, which does not adversely affect ink absorbability. At present, reasons for enhancement of the dying efficiency due to the aforesaid constitution are not yet clearly understood. However, it is considered that adsorbing components of cation fixing agents to silica particles decreases due to the fact that the wet process silica comprises a markedly small amount of an active independent silanol group compared to the vapor phase silica, whereby free cation components increase."

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In view of the above, it is submitted that the present invention is not shown or suggested by the cited art. Withdrawal of the rejections and allowance of the application are respectfully requested.

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Enclosure: Executed SUPPLEMENTAL DECLARATION UNDER 37 CFR 1.132
of Masayuki USHIKU dated November 16, 2005